REMARKS

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-6, 13-15, and 20-21, and 26 will be pending in the application. Claim 20 has been amended as suggested by the Examiner to correct informalities.

In the Non-final Office action mailed on September 24, 2003, the Examiner set forth a number of grounds for rejection of the claims. These grounds are addressed individually and in detail below.

An interview was conducted on January 22, 2004 with the Examiner. Applicants and their Attorneys thank the examiner for the time and effort. We had discussed the King reference and had come to the agreement that the proposed amended claims are patentably distinct over King. In particular, the reference to immunogenic peptides from "vespid antigen 5" and its anergy to T-cell responses in sensitive individuals. The present invention claims a hybrid polypeptide comprising at least two or more different plant allergenic proteins or fragments.

During the interview, the parties also discussed Vrtala *et al*, which demonstrates that an allergen can be converted into hypoallergenic fragments by fragmentation. More specifically, the Examiner referred to the language cited in Vrtala *et al.*, J. Allergy Clin. Immun. Vol. 97(3) (1996):pg. 782, which mentioned the preparation of a cocktail including Phl p1, Phl p2, and Phl p5 which "were transcribed by polymerase chain reaction to DNA fragments coding for the mature allergens." Applicants respectfully noted that Vrtala *et al.* does not show any experiments describing the generation of hybrid vaccines as described in the present application; and further that this particular

language does not describe the fusion of at least two or more of the major timothy grass pollen allergens. Rather it is at best a mixture. The Examiner suggested an additional independent claim to the "Giant" consisting of a hybrid polypeptide comprising a combination of all the different plant allergenic proteins or fragments thereof. Applicants have added this claim and thank the Examiner for the suggestion.

Claim objections

Claims 20 and 21are objected to under 37 CFR 1.75(c) as being dependent on non-elected claims 7 and 9. Applicants have addressed this problem by rewriting claim 20 to now depend from claim 1. Applicants respectfully request withdrawal of the objection to claims 20 and 21.

Rejections under 35 U.S.C. § 112

Claims 13-14 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement by containing subject matter in the claims which is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors at the time the application was filed, had possession of the claimed invention. In particular, the Examiner asserts that claims 13 –14 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner also asserts that there is no description of the nucleic acids that encode the hybrid polypeptide, nor does the specification provide for the structure of the polynucleotide. The Examiner further asserts that since the claim language embraces lots of variants and there is no

description of the nucleic acids which encode such, the description is insufficient since there is no structure described. Moreover, the Examiner asserts the polynucleotide is described by its function, which is not sufficient to define the polynucleotide itself. Finally, the Examiner asserts that in view of the absence of sequence information of the polynucleotide, the specification fails to meet the written description requirements. Applicants respectfully disagree.

"A patent must contain a description that enables one skilled in the art to make and use the claimed invention ...An inventor need not, however, explain every detail since he is speaking to those skilled in the art." *see In re Howarth*, 654 F.2d. 103, 105; 210 USPQ 689, 691 (CCPA 1981). "Not every last detail is to be described, else patent specifications would turn into production specifications, which they were intended not to be." See *In re Gay*, 309 F.2d. 769, 774.

The specification and claims, as amended, particularly point out and distinctly claim the method which comprises providing a polynucleotide encoding a hybrid plant polypeptide introducing said polynucleotide into a host cell, culturing the host cell thus obtained under conditions such that the hybrid polypeptide is expressed, and recovering the expression product from the cell. Moreover, the present application sufficiently describes the structure and function of a polynucleotide encoding a hybrid polypeptide according to the invention. Due to the degeneracy of the genetic code many different polynucleotide molecules may encode a single polypeptide. Therefore, a polynucleotide of the invention preferably is an expression construct for obtaining the polypeptide after expression in host cells. Further, the expression construct may further comprise components which are generally known in the art such as promoter sequence, gene

encoding resistance factors against antibiotics, a replication origin, etc. see *Specification*, page 4, line 27 to page 5, line 19.

Applicants respectfully request reconsideration of this rejection and withdrawal of these grounds of rejection in view of the aforementioned amendments and the following remarks. Applicants submit that the pending claims, as amended herein, satisfy the written description requirement.

Applicants have amended claims 4 and 5 to clarify the claims and to address the concerns in the office action regarding "derived". Applicants have addressed this problem by amending the claims. Applicants therefore respectfully request withdrawal of the objection of claims 4 and 5.

Claims 4 and 5 stand rejected as being indefinite on the basis that it cannot be determined what would be considered "substantially reduced." In particular, the claims have been amended to state "reduced". Applicants submit that the pending claim, as amended herein, satisfy the written description requirement.

Applicants and the undersigned have carefully reviewed the Office action, the remarks therein concerning the clarity of the claims, and all the pending claims. By way of the foregoing amendments and statements, Applicants have attempted to specifically address each of the comments in the Office Action concerning the written description and the claims' clarity, and respectfully submit that all of the pending claims fully comply with 35 U.S.C. § 112, first and second paragraphs. Applicants therefore respectfully request withdrawal of the rejections of the claims.

Rejections under 35 U.S.C. § 102

Claims 1,4-6, 13-15 and 20-21 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by King, and therefore unpatentable. Applicants respectfully disagree.

As noted earlier in the Remarks section, Applicants' attorney discussed the King reference to immunogenic peptides from "vespid antigen 5" and its anergy to T-cell responses in sensitive individuals. The Applicants claim a hybrid polypeptide comprising at least two or more different plant allergenic proteins or fragments. King makes no reference to plants as does the present invention.

The Examiner asserts that King claims a hybrid polypeptide comprising at least two different allergenic proteins or fragments thereof wherein each fragment consists of at least eight consecutive amino acids of the respective allergenic protein. The Examiner further asserts that the dependant claims are drawn to a method for preparing a hybrid polypeptide using PCR technology or chemical synthesis and the polypeptide comprised within a pharmaceutical composition. King discloses T cell epitopes of venom or insect allergens which are used to "anergize T cell responses in sensitive individuals" (*see* King U.S. Patent No. 5,804,201 Specification page 13 col. 6 line 57 to 60). Not only does this not disclose the present invention but also it teaches away from the Applicants invention. In particular, T cell epitopes are normally small peptides in the range between 10 to 20 amino acids, which are distinct from B cell epitopes or structures that can induce antibody responses. The Applicants further teach that the fusion of different antigens or fragments leads to stronger induction of antibody responses than the individual portions.

Applicants therefore respectfully request withdrawal of the objection of claims 1,4-6, 13-15 and 20-21.

Claims 1-3 and 13-14 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Vrtala et al., J. Allergy Clin. Immun. Vol. 97(3): 781-787 (1996), and therefore unpatentable. Applicants respectfully disagree.

The Examiner asserts that Vrtala et al. claims a hybrid polypeptide comprising at least two different allergenic proteins or fragments thereof wherein each fragment consists of at least eight consecutive amino acids of the respective allergenic protein. However, Vrtala et al. only describes the isolation of cDNAs coding for the individual grass pollen allergens but not at all the generation of fused allergens in the form of hybrids. *see* Vrtala *et al.,* J. Allergy Clin. Immun. Vol. 97(3) (1996):pgs 782-783. The Examiner further asserts that Vrtala et al, teach grass pollen belonging to the potent elicitors of Type I allergy (abstract) and that Vrtala et al, teach DNA encoding for the three major timothy grass pollen allergens representing group I (Phl p1), group II (Phl p2), and group V (Phl p5). The Examiner further asserts that Vrtala et al, teach a method for preparing a hybrid polypeptide using PCR technology comprising the same steps as recited by the instant claims.

On the contrary, Vrtala *et a*l, does not discuss hybrid polypeptides as described by the present application. As discussed during the Examiners interview dated January 22, 2004, Vrtala *et al* demonstrates that an allergen can be converted into hypoallergenic fragments by fragmentation. More specifically, per our interview, the Examiner referred to the language cited in Vrtala *et al.,* J. Allergy Clin. Immun. Vol. 97(3) (1996):pg. 782; however, Applicants noted that rather than disclosing hybrid polypeptides this discussed

the preparation of a cocktail including Phl p1, Phl p2, and Phl p5 which "were transcribed by polymmerase chain reaction to DNA fragments coding for the mature allergens." Applicants note that Vrtala *et al* does not show any experiments describing the generation of hybrid vaccines as described in the present application. In addition, this particular language does not describe the fusion of at least two or more of the major timothy grass pollen allergens. Rather it is at best a mixture. Moreover, the hybrid polypeptides of the present invention, induced vigorous anti-Phl p1-, anti-Phl p2-, and anti-Phl p6 antibody responses in comparison to the individual allergens (Figure 5). Likewise, immunization with the giant molecule induced stronger antibody responses to each of the components than immunization with the individual antigens (Figure 6A) or an equimolar mixture of the antigens (Figure 6B). *see* Specification page 15 line 17 to page 16 line 7.

Thus Vrtala *et al* fails to provide any teachings as to the fusion of the major timothy grass pollen allergens representing groups, such as shown in the present application.

Applicants therefore respectfully request withdrawal of the objection of claims 1-3 and 13-14 in view of the aforementioned amendments and remarks.

Applicants respectfully submit that the claims are in condition for allowance and early favorable notice is requested.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

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